

## Bio-efficacy of bio-pesticides against thrips, *Thrips tabaci* infesting cotton

H.V. BORICHA, K.L. RAGHVANI, M.D. JOSHI, R.R. MAKADIA, J.M. VARMORA AND P.M. BABARIYA

International Journal of Plant Protection (April, 2010), Vol. 3 No. 1 : 43-45

See end of the article for authors' affiliations

Correspondence to :

**M.D. JOSHI**

Department of  
Entomology, College of  
Agriculture, Junagadh  
Agricultural University,  
JUNAGADH  
(GUJARAT) INDIA

### SUMMARY

An experiment was conducted to evaluate the bio-efficacy of bio-pesticides against thrips, *Thrips tabaci* infesting hybrid cotton at Instructional Farm, College of Agriculture, Junagadh Agricultural University, Junagadh during *Kharif* season of 2007. The results revealed that the thiamethoxam (0.008 per cent) and acetamiprid (0.005 per cent) were found most effective against the pest. While, the combination of biopesticides with thiamethoxam (0.008 per cent) and acetamiprid (0.005 per cent) were superior over biopesticides alone against the cotton thrips.

### Key words :

Bio-pesticides,  
thrips, *Thrips tabaci*, Cotton

Cotton, the “white gold” is a premier commercial crop of Gujarat. In Gujarat, cotton is cultivated in 23.90 lakh hectares with a production of 101.00 lakh bales and productivity of 718 kg/ha (Anonymous, 2008). In India, 160 species of insect pests have been reported to attack the cotton crop right from the time of germination till the final harvesting of cotton (Agrawal, 1978). Due to introduction of transgenic cotton in India, problem of bollworm has been solved up to the greater extent. However, sucking pest causes damage throughout the crop period. Information regarding effectiveness of bio-pesticides against thrips infesting cotton is meager. Hence, an attempt was made to evaluate the bio-efficacy of bio-pesticides against the pest.

### MATERIALS AND METHODS

With a view to test the bio-efficacy of bio-pesticides against thrips, *T. tabaci*, a field trial was conducted during *Kharif* season of 2007 at Instructional Farm, College of Agriculture, Junagadh on cotton variety, G. Cot. Hybrid-10. Eleven treatments were tested in Randomized Block Design with four replications. The crop was sown at the spacing of 120 cm x 45 cm apart having gross and net plot size of 5.4 m x 4.8 m and 3.6 x 2.4 m. Total three applications of the insecticides were taken. Five plants were randomly selected from each net plot and observation was recorded before 24 hours and 1, 3 and 7 days after

treatment from three leaves (upper, middle and lower) of each tagged plant. The data thus, obtained were converted into per cent mortality by using a modified formula given by Henderson and Tilton (1955).

### RESULTS AND DISCUSSION

The results obtained from the present investigation are summarized in Table 1.

#### First spray :

Data presented in Table 1 indicated that the differences in mortality per cent of thrips in different treatments after 1 day, 3 days and 7 days of spraying were found statistically significant.

After 1 day of insecticidal spray, thiamethoxam (0.008 per cent) recorded the highest mortality of thrips (98.06%) which was statistically at par with acetamiprid (0.005 per cent), *V. lecanii* @ 1.25 kg/ha + thiamethoxam (0.004 per cent), *B. bassiana* @ 1 kg/ha + thiamethoxam (0.004 per cent) and *M. anisoplae* 1.25 kg/ha + thiamethoxam (0.004 per cent) that recorded 97.62, 95.13, 93.08 and 90.71 per cent mortality of thrips, respectively.

The treatments of *V. lecanii* @ 1.25 kg/ha + acetamiprid 0.0025 per cent, *B. bassiana* @ 1 kg/ha + acetamiprid 0.0025 per cent and *M. anisoplae* @ 1.25 kg/ha + acetamiprid 0.0025 per cent recorded 88.86 to 81.80 per cent mortality of the pest and found moderately effective. While, bio-pesticides alone viz., *V.*

Accepted :  
December, 2009

**Table 1 : Bio-efficacy of different insecticides against thrips infesting hybrid cotton**

Sr. No.	Treatments	Per cent mortality of whitefly after days								
		1 <sup>st</sup> spray			2 <sup>nd</sup> spray			3 <sup>rd</sup> spray		
		1 DAS	3 DAS	7 DAS	1 DAS	3 DAS	7 DAS	1 DAS	3 DAS	7 DAS
1.	<i>B. bassiana</i> 2.0 kg/ha	10.45*	12.95	18.13	11.78*	16.31	18.67	5.98*	12.69	18.49
		(3.29)	(5.02)	(9.68)	(4.17)	(7.89)	(10.25)	(1.09)	(4.82)	(10.06)
2.	<i>V. lecanii</i> 2.5 kg/ha	13.48	16.54	24.56	15.97	22.11	25.30	8.11	17.19	25.05
		(5.43)	(8.10)	(17.28)	(7.57)	(14.16)	(18.26)	(1.99)	(8.75)	(17.93)
3.	<i>M. anisoplae</i> 2.5 kg/ha	8.53	10.46	15.44	10.03	13.89	15.90	5.09	10.81	15.75
		(2.20)	(3.30)	(7.09)	(3.04)	(5.77)	(7.51)	(0.79)	(3.52)	(7.36)
4.	Thiamethoxam 0.008 %	82.00	81.50	81.00	82.63	82.38	81.63	82.13	81.38	81.13
		(98.06)	(97.82)	(97.55)	(98.35)	(98.24)	(97.88)	(98.12)	(97.75)	(97.62)
5.	Acetamiprid 0.005 %	81.13	80.63	80.13	79.75	79.25	78.50	79.00	77.75	77.25
		(97.62)	(97.35)	(97.06)	(96.83)	(96.52)	(96.03)	(96.36)	(95.50)	(95.13)
6.	<i>B. bassiana</i> 1.0 kg/ha + Thiamethoxam 0.004 %	74.75	74.25	73.75	74.50	73.50	72.75	74.00	73.25	72.50
		(93.08)	(92.63)	(92.17)	(92.86)	(91.93)	(91.21)	(92.40)	(91.69)	(90.96)
7.	<i>V. lecanii</i> 1.25 kg/ha + Thiamethoxam 0.004 %	77.25	76.75	76.25	77.00	76.25	75.50	76.25	74.75	74.00
		(95.13)	(94.75)	(94.35)	(94.94)	(94.35)	(93.73)	(94.35)	(93.08)	(92.40)
8.	<i>M. anisoplae</i> 1.25kg/ha + Thiamethoxam 0.004 %	72.25	71.75	71.25	71.50	70.25	69.50	70.50	69.50	68.50
		(90.71)	(90.19)	(89.67)	(89.93)	(88.58)	(87.74)	(88.86)	(87.74)	(86.57)
9.	<i>B. bassiana</i> 1.0 kg/ha + Acetamiprid 0.0025 %	66.25	65.75	65.25	66.50	65.25	64.50	66.00	64.25	62.75
		(83.78)	(83.13)	(82.47)	(84.10)	(82.47)	(81.47)	(83.46)	(81.13)	(79.04)
10.	<i>V. lecanii</i> 1.25 kg/ha + Acetamiprid 0.0025 %	70.50	70.00	69.50	68.75	67.75	67.00	68.25	66.75	65.25
		(88.86)	(88.30)	(87.74)	(86.86)	(85.66)	(84.73)	(86.27)	(84.42)	(82.47)
11.	<i>M. anisoplae</i> 1.25 kg/ha + Acetamiprid 0.0025 %	64.75	64.25	63.75	63.75	62.50	61.75	63.25	62.00	60.75
		(81.80)	(81.13)	(80.44)	(80.44)	(78.68)	(77.60)	(79.74)	(77.96)	(76.12)
	S.E. ±	2.62	2.65	2.70	3.02	2.86	2.97	3.01	3.08	3.07
	C.D. (P=0.05)	7.55	7.62	7.79	8.70	8.24	8.56	8.67	8.87	8.83
	C. V. %	9.44	9.48	9.50	10.87	10.22	10.61	11.25	11.31	11.10

\*Angular transformation

Figures in parentheses are original values

*lecanii* @ 2.5 kg/ha, *B. bassiana* @ 2 kg/ha and *M. anisoplae* @ 2.5 kg/ha recorded significantly less mortality per cent of thrips i.e. 5.43, 3.29 and 2.20 per cent, respectively.

More or less similar observations were recorded on 3 and 7 days of insecticidal spray. The only difference was that all the three bio-pesticides alone showed increasing trend in the pest mortality with the duration.

### Second and third sprays :

Similar trend in the mortality of the pest in different treatments was observed in second and third applications (Table 1).

Ulaganathan and Gupta (2004) found that

acetamiprid, imidacloprid, beta-cyfluthrin and lambda-cyhalothrin were effective in reducing the thrips population. Similar observations were also reported by Saradava (2004). Hence, present investigations are in confirmation with the results of the earlier research workers.

The results of three applications of the insecticides revealed that thiamethoxam (0.008 per cent) and acetamiprid (0.005 per cent) were found most effective insecticidal treatments against thrips of cotton. However, the combination *V. lecanii* 1.25 kg/ha and *B. bassiana* 1 kg/ha with thiamethoxam was also found equally effective against thrips of cotton.

---

Authors' affiliations:

**H.V. BORICHA, K.L. RAGHVANI, R.R. MAKADIA, J.M. VARMORA AND P.M. BABARIYA**, Department of Entomology, College of Agriculture, Junagadh Agricultural University, JUNAGADH (GUJARAT) INDIA

---

## REFERENCES

**Agrawal, R.A.** (1978). Cotton insect pests and their control. *Richer Harvest*, **1**: 22-29.

**Anonymous** (2008). www. FAO. Organization.

**Henderson, C.F. and Tilton, E.W.** (1955). Tests with acaricides against the brown wheat mite. *J. Econ. Ent.*, **48**(2): 157-161.

**Saradava, D.A.** (2004). Management of sucking pests infesting groundnut under dry farming conditions. M. Sc. (Ag.) Thesis Junagadh Agricultural University, Junagadh, 58 p.

**Ulaganathan, P. and Gupta, G.P.** (2004). Effect of insecticidal spray schedules on sucking pests of American cotton, *Gossypium hirsutum* L. *Ann. Plant Protec. Sci.*, **12**(2): 283-287.

\*\*\*\*\*